Short communication

ChatGPT and the Possibility of Reinventing the Education Ecosystem

Abstract: ChatGPT from the emergence of a great momentum, information technology has always been a critical impact on the education ecosystem, the education sector believes that ChatGPT is also so. Regarding the polarized attitudes of embracing and opposing ChatGPT, the author believes that it is still the old saying that we should "take the best and discard the dross", and think about it from the three aspects of recognizing the essence of ChatGPT, and the possibilities brought by ChatGPT to the education ecology, such as the learners, the teachers, and the education system, as well as the return to the essence of education.

Key Words： preschool education; ChatGPT; educational ecology; artificial intelligence

Introduction :

The emergence of ChatGPT has sparked a global, multi-domain sensation, with debates swirling around whether it is a case of "high-tech plagiarism," a "Pandora's Box," or an "Aladdin's Lamp." Scholars discussing ChatGPT have taken a clear neutral stance, acknowledging that its integration into daily life and education is an unstoppable trend. They advocate for preparing in advance, embracing it cautiously, and understanding it thoroughly to navigate potential challenges. Although ChatGPT is still in its infancy, and most discussions about its integration into education are speculative, it is crucial to comprehensively understand the changes and potential risks it may bring to education. Furthermore, we should contemplate the future direction of education to better fulfill its significant mission of "adaptation" and "transcendence." There is limited practical application of artificial intelligence in kindergarten teaching activities. Preschool educators should first understand the essence of ChatGPT and clarify the essence of education, seeking a symbiotic relationship between preschool education and ChatGPT.

1. The impact of ChatGPT on the educational ecosystem

1.1 Autonomous learning and academic integrity face new challenges

Compared to traditional search engines, ChatGPT can provide more comprehensive knowledge and even select more precise or creative answers. With the help of the database behind ChatGPT, learners can transcend their original knowledge perspectives and gain broader insights. The advantages for learners are obvious; it's like having the world's smartest brain assisting you with your homework, accessible anytime and anywhere.

In this context, autonomous learning is being redefined. ChatGPT can provide personalized guidance and interactive assistance to learners, creating favorable conditions for their autonomous learning. When learners are not in a school setting and cannot obtain face-to-face guidance from teachers or elders, ChatGPT can provide targeted answers, real-time feedback, and guidance through dialogue and interaction for each learner's different questions[1]. ChatGPT can serve as an encyclopedic personal learning assistant for learners, aiding them in personalized autonomous learning or academic research.

However, beneath this convenience lies a greater crisis. In terms of creativity, when learners become heavily reliant on ChatGPT, the initiative in learning shifts, and learners may become slaves to technology. The role of general large models is such that they may no longer require the arrangement of knowledge; students obtain facts from content

automatically generated by ChatGPT without needing to deeply understand the theoretical basis behind it. Students immersed in short-term, superficial learning fail to develop deeper theoretical thinking abilities, leading to a potential decline and obscuring of creativity [1], thereby resulting in a superficialization of cognitive structures [2]. Additionally, the results generated by ChatGPT are based on the rearrangement of knowledge derived from big data, and whether or not they constitute original work is a controversial issue. If students use ChatGPT to complete homework and academic research, obtaining higher scores without it being considered plagiarism, then surely no one would resist the temptation of ChatGPT. In terms of critical thinking, ChatGPT still has the potential to make errors, if students excessively trust the results generated by ChatGPT without discernment or have limited discernment abilities, they may acquire incorrect knowledge without realizing it. In terms of knowledge authority and teacher-student, student-student interactions, when learners no longer view teachers as authorities on knowledge and no longer obtain knowledge outcomes through practice, they may refuse to cooperate with teachers and classmates in reality, with the subjects of learning imprisoned on their respective "islands." [1]

1.2 Teacher Professional Development and Career Crises

The essence of teachers' professionalism encompasses three dimensions: teaching students how to learn, nurturing students' growth, and providing services. The foundation for teachers' professional development includes their professionalism, knowledge, and abilities. Teachers' professional development entails leveraging their professionalism, knowledge, and abilities through scientific methods to achieve the goals of teaching students how to learn, nurturing their growth, and providing services [3]. Like blackboards, textbooks, and smart classrooms, ChatGPT will also become a teaching aid for teachers in the future, assisting them in their daily work, reducing their workload, and enabling them to better focus on teaching. With ChatGPT's help, teachers will have more energy to reflect on their teaching effectiveness and ponder how to advance their professional development.

Through ChatGPT's database and dialogue functions, it can provide ideas for teachers' curriculum design before class, enrich teaching content, simulate classroom dialogues to understand students' confusions, and assist teachers in lesson preparation. In the classroom, ChatGPT can also serve as an AI teaching assistant, providing an instant feedback platform for teachers and students, answering their questions in real-time, and increasing the vividness, interest, and appeal of the classroom. This aids students in understanding

complex content and concepts. After class, ChatGPT can participate in homework evaluation. [1] It can be observed that ChatGPT can assist teachers in completing a complete teaching plan. Leveraging information technology in teaching also belongs to one aspect of teachers' professional competence development. However, when ChatGPT is capable of completing most of teachers' work, it also brings about the fear that teachers may be replaced.

In the face of increasingly intelligent human-computer interaction, teachers may face the risk of being replaced, but they will not be easily supplanted. When teachers excessively rely on ChatGPT to develop curriculum plans and implement them verbatim based on the lesson plans generated by ChatGPT, teaching may become alienated into one-dimensional knowledge impartation, posing risks of rigid teaching processes and alienated teacher-student interactions [1]. Teachers may find themselves merely reciting texts, with the role of "imparting knowledge" falling short of the goal of nurturing students and even failing to match the problem-solving capabilities of artificial intelligence. To address the crisis of teachers' existential value, we must return to the core of teachers' professionalism, deepening their professional identity and firming their professional beliefs [4] . Teachers' sense of identity with their profession is closely related to their own capabilities. Teachers should recognize how to teach students how to learn, how to nurture students, and what kind of individuals to nurture, leveraging their human advantages in an era of human-computer interaction and coexistence between human and AI teachers.

1.3 Chain Reactions in Educational Ecology

It is already a consensus that ChatGPT will bring profound changes to future education, particularly in facilitating the reconstruction of relationships and role transformations among the three core entities in educational activities: teachers, conversational robots (like ChatGPT), and students [5]. ChatGPT aids students in becoming self-educators, prompts teachers to become reflective educators, and ChatGPT itself evolves into an institutionalized educator within school education, thus complicating the roles of individuals within the educational ecosystem. [6]

Humanity is entering an era of intelligent interconnection among humans, machines, and objects, characterized by ternary fusion. The integration of AI conversational robots like ChatGPT into education will have both advantages and disadvantages for educators,

learners, and educational systems. ChatGPT is neither the first nor the last demonstration of information technology's potential.

The knowledge revolution triggered by ChatGPT may, to some extent, exacerbate knowledge alienation, with major risks manifesting in four aspects: difficulty in distinguishing the authenticity of knowledge, difficulty in ensuring the authority of knowledge, intensification of knowledge fragmentation, and the disintegration of universal knowledge, which may even jeopardize people's faith in knowledge. [1] The process of education involves understanding knowledge and exploring its essence. When knowledge becomes untrustworthy, education will also struggle to remain unscathed. The vulgarization of education refers to "in the combination of general large models and education, superficial technical use and sensory pleasure obscure people's pursuit of deeper meanings of education. Education is replaced by superficiality, sensuality, and impressionism, while depth, rationality, logic, and reflection can no longer be embodied in education, turning learners into deformed 'one-dimensional people' eventually." [2]

ChatGPT is poised to replace education focused solely on knowledge impartation. "The role of teachers will shift completely from knowledge impartation to intellectual guidance, increasingly tending towards a one-on-one teaching model." [7] When ChatGPT becomes an instructional tool in teaching, it poses greater challenges to teachers' educational wisdom and professional competence. The starting point for novice teachers has also become higher, further stimulating normal universities to consider how to cultivate future teachers' sense of responsibility and mission.

2.Challenges and Reflections Posed by ChatGPT

2.1 ChatGPT should stay within its designated scope

Every technological revolution demonstrates its "creative destruction effect" [2]. ChatGPT has become a popular search tool, and the idea of completely eliminating its use can be described as a pie in the sky. Technological empowerment drives human evolution, and no one knows for sure how far artificial intelligence will develop in the future. However, no matter how powerful artificial intelligence becomes, humans must master the technologies they invent and stand at a higher level than AI. Embracing ChatGPT comes with conditions and limitations. We must consider how to use it with dignity, fully understand the challenges it brings, and rise to meet those challenges.

Artificial intelligence aims to enable machines to think like humans and possess intelligence. However, to date, AI can only imitate human thinking and has not yet developed the ability to generate original thoughts independently, as humans do. Nevertheless, "it can push humans to explore and engage in more creative labor, prompt changes in traditional education and learning methods, and set higher standards for human development in the future." [6] There is also a possibility that when people use ChatGPT for dialogue and communication, they may unconsciously be influenced by the patterns and templates behind the robot. "In the imitation and reinforcement of these patterns, people may develop uniform cognitive structures and knowledge networks, and learners may become homogenized and standardized individuals...falling into the trap of homogeneity." [2] In this scenario, the status of humans and robots could be reversed, with humans imitating machines rather than the other way around, turning humans into robots. To avoid the risk of cognitive and thinking homogenization, individuals need to remain vigilant.

Regarding the governance of ChatGPT, beyond individual self-awareness, legislation in the fields of internet and artificial intelligence has always been a weak area. Keeping the educational laws and regulations in sync with the constantly evolving ChatGPT and other AI technologies poses a significant and ongoing challenge. On the ethical front, it is imperative to expedite the enhancement of AI ethics literacy among educators at all levels, strengthen the consciousness of "ethics first," reinforce self-discipline and autonomy, formulate usage and application guidelines for content-generating smart tools such as ChatGPT, and ensure that students, teachers, administrators, and others understand and voluntarily abide by these ethical guidelines. Together, we can foster a healthy ecosystem for the educational application of ChatGPT. [8]

2.2 Returning to the essence of education and starting from the perspective of humans is crucial

Artificial intelligence liberates humans from the use of tools, and each iteration and update of AI brings about the elimination of repetitive and simple physical labor. However, as observed in ChatGPT, AI also signifies the liberation of humans from instrumental mental labor. As humans gradually free themselves from instrumental labor, it marks the end of the instrumentalist approach and the beginning of a higher path. This shift implies a further elevation of the status of humanistic spirit in education and the mainstream

adoption of the spirit of free exploration. [7] This also means that education must focus on cultivating creative and innovative talents.

Returning to the core of educating individuals, teachers must embrace a dual mission: firstly, shaping students' emotions, attitudes, and values; and secondly, fostering the development of higher-order skills. [1] In the future, the requirement for comprehensive development in morality, intelligence, physique, aesthetics, and labor will remain unchanged. The scenario of human-computer interaction will further test students' voluntary adherence to values and moral standards, and school education should place greater emphasis on cultivating students' values, emotional communication, and willpower.

In this era of exploding knowledge and instant access to information, people are becoming both smarter and more ignorant. They can obtain universal and factual knowledge anytime, anywhere, but these knowledge points exist outside their brains, leading to questions about whether they have truly acquired this knowledge. What is known is that ChatGPT has rendered repetitive mental labor "useless." Against this backdrop, "critical thinking, creativity, communication, collaboration, aesthetics, emotional intelligence, and character will be crucial in the educational ecology." [9] The traditional education model of rote memorization is being pushed to the brink. Therefore, education must adapt to this new environment by focusing on cultivating students' critical thinking, creativity, and other higher-order skills. Traditional education methods must be reevaluated and updated to meet the demands of the current era, ensuring that students are not just passive recipients of knowledge but active learners who can apply their knowledge creatively and ethically.

Education plays a dual role in fostering creativity. On one hand, it enhances creativity by increasing knowledge. On the other hand, it can also stifle creativity by suppressing curiosity and imagination. Therefore, education should create a more relaxed environment with ample space and time conducive to students' individual development. It is crucial to better protect students' curiosity, stimulate their imagination, and guide them to pursue higher values, avoiding short-term utilitarianism. [10] Meanwhile, the integration of artificial intelligence, such as ChatGPT, into education has made educational evaluation more challenging. There is a need for deeper consideration on how to evaluate students' comprehensive development, information literacy, and creativity. The traditional approach of measuring academic achievement based on standard answers is on its way out. Instead, the focus of education should shift towards cultivating abilities such as independent

thinking, creativity, emotions, values, and interpersonal skills. [11] In summary, education must adapt to the new realities brought about by artificial intelligence. It should strive to create an environment that nurtures creativity and individuality, while also rethinking the way students are evaluated. By shifting the focus from rote memorization and standard answers to higher-order skills and personal development, education can better prepare students for the future and help them thrive in an increasingly complex and interconnected world.

3.The Era's Bond Between ChatGPT and Preschool Children

3.1 The Innate Advantages of Young Children in Coexisting with the Times

In the present and future, we are amidst a flourishing era of digital technology and artificial intelligence (AI), marked by constant innovation and transformation that will only continue to advance and profoundly impact various aspects of our lifestyles. Preschool education lays the foundation for school education and lifelong learning, while preschool children, as the newborns and natives of this era, possess a natural advantage in learning new information technologies. Preschool education and kindergartens should actively respond to the demands of AI education, integrating emerging technologies such as AI and ChatGPT into kindergartens and children's lives as educational goals, while innovating educational content and methods to allow children to grow amidst the waves of the times.

AI can provide auxiliary services for kindergarten management and teacher instruction, such as information management in kindergartens, hardware facilities and software platforms like facial recognition, video surveillance, and home-school co-education platforms, as well as information-based teaching equipment like classroom whiteboard projections, which constitute the hardware foundation for implementing AI in kindergartens. In terms of teachers' work, AI supports curriculum design, evaluation of children's development, and professional training, thereby improving teachers' work methods and helping them enhance their professional competence and teaching effectiveness. [12] At the same time, AI can lighten the administrative burden on kindergarten teachers, freeing them from tedious daily tasks to focus more on nurturing children and engaging in creative educational and instructional work. [13]

However, the application of information technology in kindergarten education and instruction remains limited. AI does not directly participate in teaching in kindergartens or

only does so indirectly. Firstly, kindergartens can provide very few or almost no AI devices. Secondly, whether AI can be effectively utilized in kindergartens largely depends on teachers' ability to apply information technology, digital literacy, and skills. The practical application of AI, such as ChatGPT, in kindergarten education and instruction remains a long and arduous journey.

3.2 The principles of early childhood cognition are embedded within ChatGPT

"The learning approach of ChatGPT embodies significant educational thinking, which may hold certain reference value for human education. For instance, it has been observed that ChatGPT, like humans, encounters problems that cannot be solved in one step and requires breaking down large problems into smaller ones to achieve the ultimate goal of resolution." [6] At the preschool stage, children's cognitive abilities and problem-solving skills are in their initial stages of development, and the learning approach of ChatGPT aligns with the way preschool children's minds grow. It is not just the learning approach of ChatGPT; machine learning essentially simulates human consciousness, thinking, and information processing. The concept of "deep learning" was initially applied in the field of machine learning and subsequently, research in the field of education focused on deep learning from the perspective of learning sciences. Scholar Wu Yongjun defines deep learning as "a process of meaning generation in a specific sociocultural context, where learners, through interaction with others and the environment, focus on the organic connections between knowledge, ultimately enabling transfer and solving real-life problems." [14] Perhaps some may believe that "deep learning" is not relevant to preschool children with lower cognitive levels, but in fact, the problem-solving skills that preschool education aims to cultivate are precisely deep learning. Elements that encourage problem-solving in young children include relevance to their life experiences, mobilization of their life and learning experiences, problems that pose a certain challenge to stimulate their enthusiasm, perseverance, and other learning qualities, and encouragement to use multiple strategies to solve problems, including seeking help from teachers and collaborating with peers. Therefore, young children possess the ability for deep learning, albeit not targeted at highly difficult problems. Scholar Wang Xiaoying proposes a logical framework for deep learning in young children: problem-solving orientation, positive emotions as motivation, hands-on creation as a foundation, peer cooperation as support, and evaluation and reflection as the main axis. [15]

In modern life, it is not uncommon to observe a phenomenon where young children, who may not even know how to read, are already proficient in operating mobile phones. They can engage in games or browse video apps that require no operational skills based on simple and straightforward prompts. The proficient use of smart devices by young children has become a widespread phenomenon. This inevitably brings potential risks such as vision impairment, exposure to inappropriate content, and hindrance to interpersonal communication. However, it also offers abundant educational resources, providing children with rich opportunities for perception and manipulation. In terms of language development, information technology devices can enhance children's participation and comprehension in language learning, create a favorable language learning environment, optimize the language learning and transfer process, and strengthen their oral cooperation and communication skills. [16]

"Existing research on information technology in preschool education mainly focuses on kindergarten teachers' exploratory applications of information technology in educational and teaching practices, as well as theoretical explorations by experts and scholars on information technology in preschool education." [17]Given the irresistible trend of ChatGPT, it is imperative for teachers to update their educational concepts and leverage new technologies to promote their professional development and reduce workload. In China, the phenomenon of kindergarten teachers using AI to find educational resources and write work reports is becoming increasingly common. It is exciting to anticipate how ChatGPT will further integrate into preschool education in the future.

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